

a fine adjustment stage that is movable within predetermined ranges in said scanning direction and in a direction perpendicular to said scanning direction with respect to said scanning stage, said fine adjustment stage mounting said object thereon, said fine adjustment stage having a movable mirror;

actuators arranged in said scanning direction and in the direction perpendicular to said scanning direction with respect to said scanning stage for driving said fine adjustment stage;

an interferometer that irradiates a measurement light beam on said movable mirror to detect a displacement of said fine adjustment stage with respect to said scanning stage; and

a cooling unit that cools said actuators by circulating a predetermined cooling fluid, said cooling unit circulating said cooling fluid from a portion near an optical path of the light beam from said interferometer toward the actuators.

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38. (Twice Amended) A stage apparatus comprising:
a first stage that is movable linearly in a first direction;
a second stage that is movable in said first direction and in a second direction perpendicular to said first direction with respect to said first stage;
a first electromagnetic actuator that drives said second stage with a second thrust in said second direction with respect to said first stage; and
a second electromagnetic actuator that is different from said first electromagnetic actuator to drive said second stage with a first thrust in said first direction with respect to said first stage, said first thrust being different from said second thrust.

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39. (Twice Amended) An apparatus according to claim 38, wherein said first electromagnetic actuator is a moving magnet type, and a first coil member of said first electromagnetic actuator is fixed to said first stage.

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40. (Twice Amended) An apparatus according to claim 38, wherein said second electromagnetic actuator is a moving magnet type, and a second coil member of said second electromagnetic actuator is fixed to said first stage.

41. (Twice Amended) An apparatus according to claim 39, further comprising a cooling unit that cools said first coil member of said first electromagnetic actuator by circulating a cooling fluid.

42. (Twice Amended) An apparatus according to claim 40, further comprising a cooling unit that cools said second coil member of said second electromagnetic actuator by circulating a cooling fluid.

43. (Amended) An apparatus according to claim 41, wherein said second stage has a movable mirror; and further comprising:

an interferometer that irradiates a measurement light beam on said movable mirror to detect a displacement of said second stage with respect to said first stage; and

wherein said cooling unit circulates said cooling fluid from a portion near an optical path of the light beam from said interferometer toward said first coil member.

44. (Amended) An apparatus according to claim 42, wherein said second stage has a movable mirror; and further comprising:

an interferometer that irradiates a measurement light beam on said movable mirror to detect a displacement of said second stage with respect to said first stage; and

wherein said cooling unit circulates said cooling fluid from a portion near an optical path of the light beam from said interferometer toward said second coil member.

45. (Twice Amended) An apparatus according to claim 38, wherein at least one of said first and second electromagnetic actuators is constituted by a pair of subactuators which are parallelly arranged.
